Infrared Two Focus

Digital Scouting Camera *User's Manual*

SG860U-HD

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1 Instruction

1.1 General Description

This camera is a low glow infrared two focus surveillance device working automatically.

It can be triggered by any movement of human (or animals) in a certain region of interest (ROI) monitored by a highly sensitive Passive Infra-Red (PIR) motion sensor，and then take high quality pictures (up to 8 mega pixels) or video clips.

It can also be triggered by a timer which means the camera can capture pictures or video clips at specified time intervals regardless of whether there is a motion of human or animal.

The camera is equipped with a set of built-in low glow infrared LEDs and an ultrasonic motor. It can achieve two tranches of focus according to the surrounding conditions, so the camera can take clear, black and white pictures or videos in the dark night. Also it takes clear color pictures or videos under sufficient daylight.

The camera consumes very little power (at μA level) at surveillance mode. If powered by 8 new AA alkaline batteries, the camera can stand-by about 6 months.

The device is designed for outdoor use and is resistant against water and snow. Furthermore, the camera can be used as a portable digital camera.

1.2 Application

This camera can be used as an automatic surveillance device for guarding and recording unexpected intrusion to homes, shops, schools, depots, offices, taxis, work sites etc. It can also be used as a trail camera for hunting or monitoring animals by recording the traces of wild animals. It can be left alone for weeks and months and it will save event records automatically in digital format.

1.3 Camera Interface

1.3.1 Camera Body Interface

The camera has the following interfaces: a 2.0" TFT LCD display screen, operation panel, USB connector, SD card slot, TV output and external DC power connector. Fig.1 shows the front view of the camera and its function parts. Fig.2 shows the operation panel and display screen. Fig.3 shows the bottom view of the camera and its I/O interface.

Take a few moments to familiarize with the camera controls and displays. It is helpful to bookmark this section and refer to it when reading through the rest of the manual.

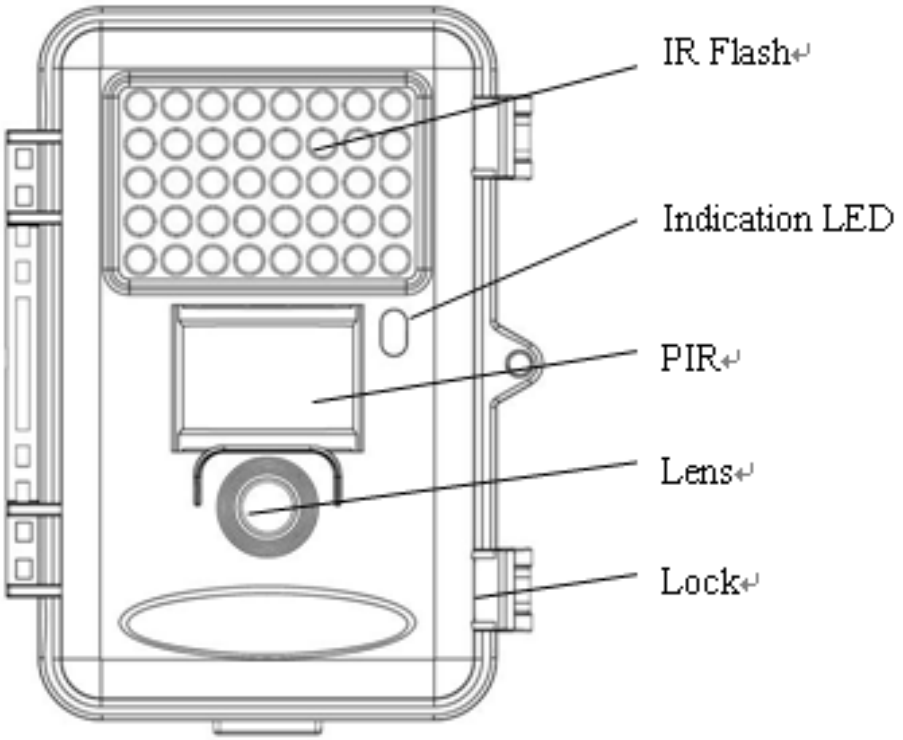

Figure 1: Front view

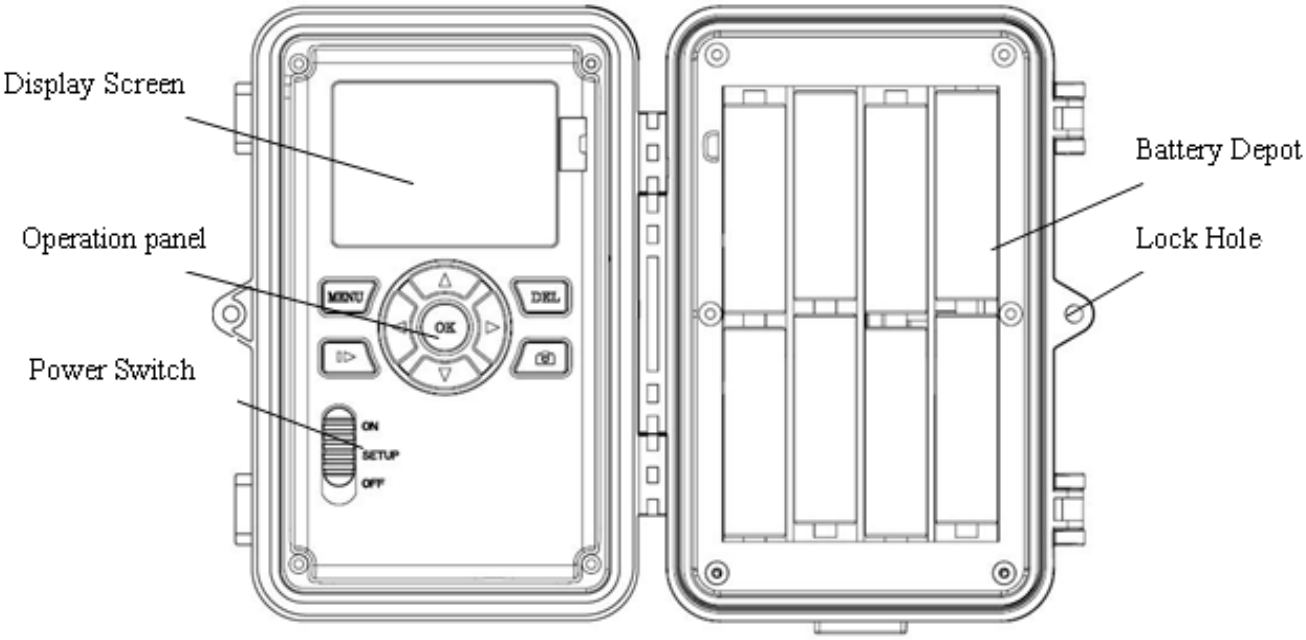

Figure 2: Operation interface

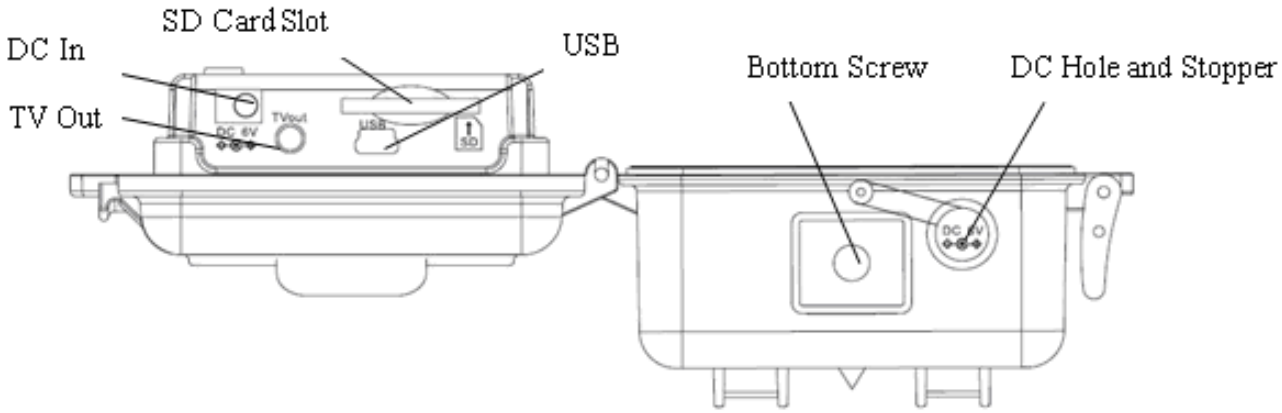

Figure 3: Bottom view

1.3.2 Key Notes

"**MENU**": to enter the program menu in preview mode;

"▲""▼""◄""►": for parameter settings as described in the user's manual.

"**OK**": to save parameter settings and play videos.

"": to exchange between playback and preview.

"**DEL**": to delete an image.

"": to capture a photo or record a video manually.

1.3.3 Shooting Information Display

Fig. 4 shows a sample of the LCD Display of the Programming Menu.

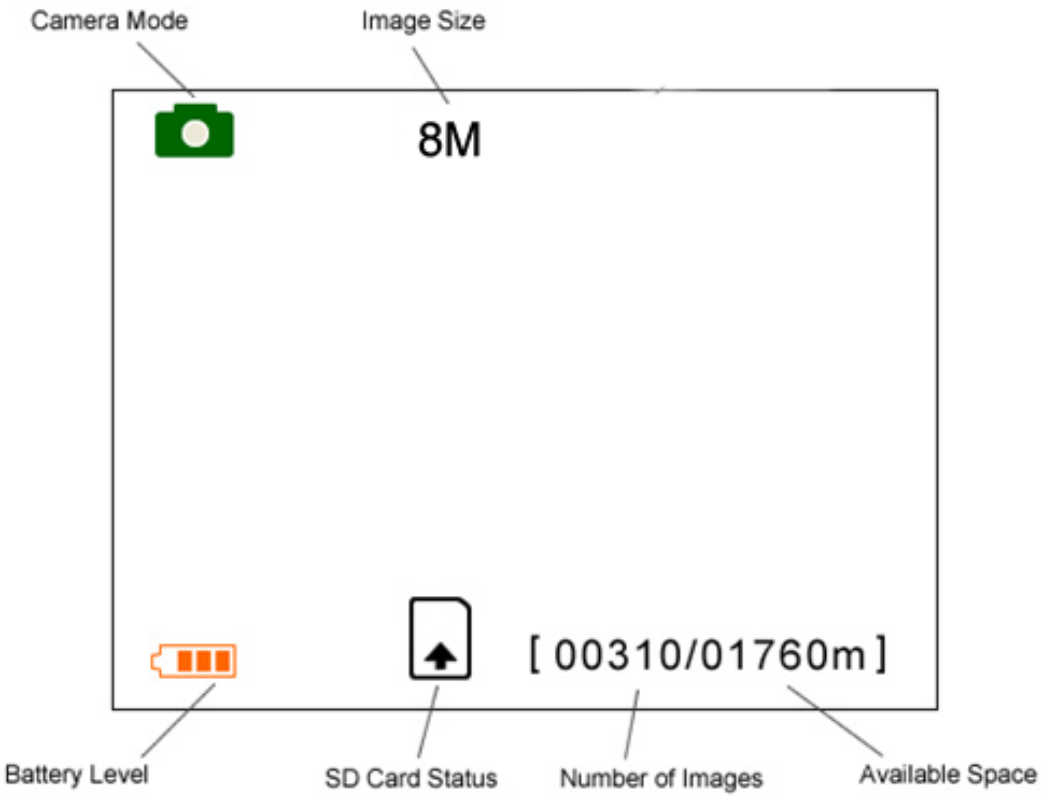

Fig. 4: LCD Display

1.4 Saving Images or Videos

The camera uses a standard SD (Secure Digital) memory card to save images (in .jpg format) and videos (in .avi format). SD and SDHC (High Capacity) cards up to a maximum 32 GB capacity are supported. Before inserting the SD card be sure that the SD card is unlocked.

2 Cautions

★ **The working voltage of the camera is 6V.** The camera is supplied by four AA batteries.

★ Please install batteries according to shown polarity.

★ **Must insert the SD card before power on camera. The camera will not work properly unless a working SD card is detected by the camera**

★ Please unlock the write-protect before inserting the SD card.

★ Please insert the SD card when the power switch is at **OFF** position before testing the camera. The camera has no internal memory for saving images or videos. If no SD card is inserted, the camera will shut down automatically after a continuous indication sound.

★ Please do not insert or take out the SD card when the power switch is at **ON** position.

★ It is recommended to format the SD card by the camera when used for the first time. Many other SD cards formatted by other cameras have poor compatibility with different brands of cameras. So it is best to format the SD card with this camera or on a computer.

★ In the **SETUP mode, the camera will shut down automatically after 3 minutes if no operation is done.** Please turn on the power again if you want to continue to work with the control.

3 Easy Operations

3.1 Loading batteries

Use 8 or 4 AA batteries or 6V external battery for power supply (Fig. 5).

Fig. 5: Battery Configurations of 8 or 4 batteries

Please use high-capacity and high-performance alkaline batteries (recommended), rechargeable Lithium batteries or rechargeable NiMH batteries.

3.2 Inserting the SD card

The camera has no internal memory for saving images or videos. **If no SD card is inserted, the camera will shut down automatically.**

3.3 Powering on and Entering into the ON Mode

The camera has three basic operation modes:

1. **OFF mode**: to turn off the camera.
2. **SETUP mode**: to set up camera or to playback the photos or video clips.
3. **ON mode**: the camera will take pictures or videos automatically according to the previous programmed settings when human or animals enter into the monitoring region.

After switching the camera to ON position, the motion indication LED (red) will blink for about 10s. This time interval is for you to make the camera ready for automatic surveillance operation, e.g., to close the bottom cover and to lock it, to fix the camera on a tree and to walk away.

3.4 Power Off

Switch the camera to **OFF** position to power off the camera. Please note that even in the **OFF** mode, the camera still consumes certain power at μA level. Therefore, please remove the battery if the camera will not be used for a long time.

4 Advanced Operations

After you are familiar with the basic operations of the camera, you are now ready for advanced operations，and the options and parameters of the camera are explained in more detail.

4.1 Enter into the SETUP mode

There are 3 states in the SETUP mode: preview state (preview the scene in the front of the camera), setting state (make customer settings), and playback state (view photos or videos via the 2.0" LCD display).

4.1.1 Preview

After switching the camera to SETUP mode, it enters into the preview state.

Press to exchange between playback mode and preview mode.

4.1.2 Customer Settings

Press **MENU** to manually customize the camera settings displayed on the LCD screen. The detailed operations will be described in this "Advanced Operations" chapter.

4.1.3 Manual Capturing

Press to manually capture photos or record videos. Press again to stop the manual capturing of a video.

4.1.4 View Images or Videos

Press to view images or videos; the latest image or video will be shown in the screen. Press "▲" or "▼" to view the previous

or next image or video.

4.1.5 Delete Images or Videos

Press **DEL** to delete images or videos. Note the **DEL** button just works in Playback state. So if it's in Preview state, you should press to enter into Playback state.

4.2 Triggering modes

There are 3 triggering modes of the camera: **PIR trigger**，**Time lapse** (i.e. Timer trigger) and both **PIR trigger & Time lapse.**

1. PIR trigger

PIR trigger is the default setting. The camera works only when motions are detected. If PIR trigger is set as **PIR Off**, the camera stops PIR trigger.

2. Time lapse

The **Time lapse** default setting is **Off,** which means the Timer trigger is disabled. When Timer trigger interval is changed to a non-zero value, the camera starts to work at a preset interval. User needs to set the PIR triggering to Off (choose **PIR trigger** as **Off**) if only the Time lapse trigger mode is desired.

3. PIR trigger & Time lapse

If both PIR trigger and time lapse trigger are desired, user needs to go to **PIR trigger** to set **"normal, high or low"** sensitivities according to the external environments, and needs to set the **Time lapse** to a desired non-zero value. The camera will capture pictures or videos in a preset time interval even if no motion gets detected;

the camera will also capture pictures and videos when a motion gets detected.

4.3 Settings Menu

To view the camera settings menu, press **MENU** in the **SETUP mode** (Power switch is at **SETUP** position).

Use "▲" or "▼" key to select the sub-menu, use "◄" or "►" key to select the different options, then press "**OK**" to save the setting and the option will be un-highlighted.

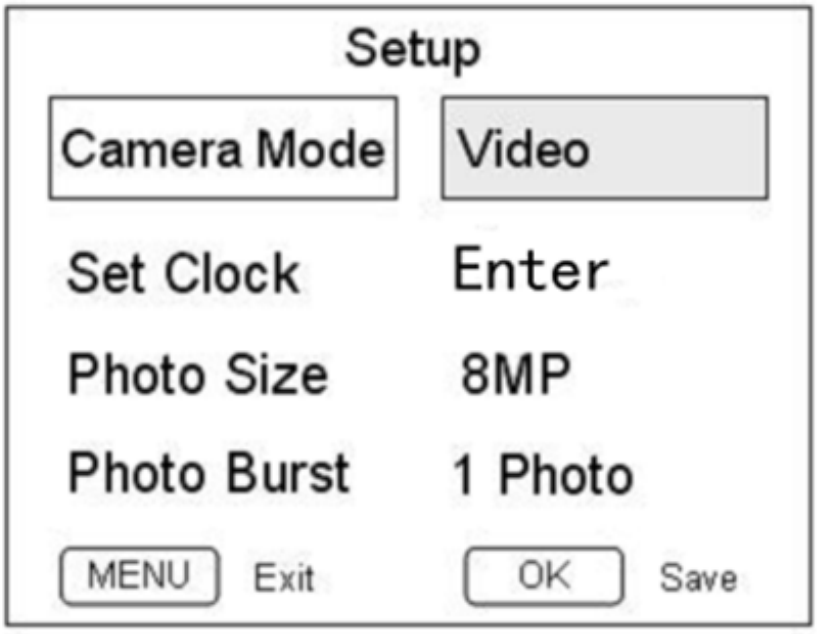

Fig. 6: LCD Display of Settings Menu

4.3.1 Setting Items

Setting Items	Description
Camera Mode	There are two camera modes: **Photo** or **Video**. You can enter the Setup interface to set the camera mode or use shortcut key to switch the camera mode. Via shortcut key: press "▲" key to set to Video

	and press "▼" key to set to Photo in SETUP mode.
Set Clock	You can change the date and time when necessary, e.g., after every battery change. The date format is **month/day/year**, the time format is **hour: minute: second**. Press "►" to select item, press "▲" or "▼" to change the value. The valid value for year is between 2009 and 2050.
Photo Size	8MP (mega pixels) or 5MP (mega pixels).
Photo Burst	It means the shooting number of each triggering in Photo mode. You can choose from 1 to 3 Photos.
Object Distance	"Far" means 1.5m to infinity. When you choose **Far**, the lens focus is on a farer focus on the day and on a nearer focus at night because the focal length of infrared light which turns on at night is near than visible light. That means you can get clear pictures with farer focus than 1.5m at daytime. "Near" means 0.5m to 8m. When you choose **Near**, the lens is on a nearer focus both day and night. The clear pictures can reach to less than 1m.
Video Size	There are two video size: 720P HD （1280×720） and VGA (640×480).
Video Length	It extends from 5 to 60 seconds with a step of one second.
Time Lapse	Time lapse means the camera can capture images or videos at a preset time interval regardless of whether motions are detected. The default parameter is **Off,** which means the timer function is disabled. Changing this parameter to

	a non-zero value turns on the Time Lapse mode, and camera will take photos at given time interval. ***Please note that if the PIR Trigger is set to* Off*, then the Time Lapse can't be set to* Off*.***
PIR Trigger	This parameter defines the sensitivity of the PIR. There are four parameters: **High, Normal, Low** and **Off.** The default value is "Normal". The higher degree indicates that the camera is more easily triggered by motion, taking more pictures or recording more videos. It is recommended to use high sensitivity degree in a room or environment with little interference, and to use low sensitivity for outdoor or environment with lots of interferences like hot wind, smoke, near window etc. Furthermore, the sensitivity of the PIR is strongly related to the temperature. Higher temperature leads to lower sensitivity. Therefore it is suggested to set a higher sensitivity for high temperature environment. ***Please note that if the time lapse is set to Off, then the PIR can't be set to Off.***
PIR Interval	This parameter means how long the PIR sensor will be inactive after each triggering in ON mode. During this time the PIR of the device will not react to the motion of human (or animals). The minimum interval is 0 second (meaning the PIR works all the time). The maximum interval is 1 hour (meaning the PIR will be disabled for 1 hour after each triggering). Please note that there are a few seconds of internal processing delay between each trigger, even if 0 second is set.
Format SD	If you choose "Format SD", the system will delete all images or videos stored in the SD card. So make sure that you have made a backup of important data.

Default Set	Restore customer settings to default values.

Table 1: Submenu

4.3.2 Default Set

Choose **Default**, all the settings will be changed to the factory default settings. Please refer to table 1 for the default settings:

Parameter name	Default	Other settings
Camera Mode	Photo	Video
Set Clock	Enter	
Photo Size	8MP	5MP
Photo Burst	1 Photo	2 Photos, 3 Photos
Object Distance	Far	Near
Video Size	1280x720	640x480
Video Length	10 Sec	5-60 Sec
Time Lapse	Off	5 mins to 8 hours
PIR Trigger	Normal	High, Low, Off
PIR Interval	5 Sec	0-55 Sec, 1-5min，10-60 min
Format SD	Enter	
Default Set	Save	

Table 2: Default settings of the camera

4.4 Firmware upgrade

This camera provides an upgrading function for the users. Upgrade is needed only when an improved firmware is available.

5 Mounting the Camera

When using the camera in outdoor environment, such as scouting or monitoring the living habits of wild animals, you need to mount the device on a certain place properly. It is recommended to mount the camera on a tree with diameter about 5.9 inches (15cm). To get the optimal picture quality, the recommended distance is 5m from the tree to the target monitoring area and height from the ground is 4.9ft~6.5ft (1.5m~2m). Adjust the viewing angel properly .

There are two ways to mount the camera。

Using the belt: to use the belt to fix the camera on a tree is illustrated in Fig. 7. Take the belt toes to go through the two back holes of the camera. At the end, tie the two toes to the tree to finish fixing.

Fig 7: Fixing the camera with belt

Using bottom screw.

6 Trouble shooting

1 There is something in front of the camera lens. Is the camera broken?

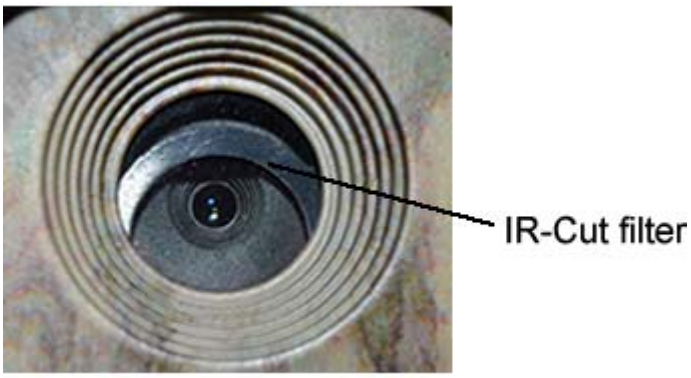

Fig. 8: Floating IR-Cut Lens

A: The camera is not broken. It's an IR-Cut filter. When the camera is powered on, the IR-Cut will be reset and cover the lens. Only when the camera is powered off, the IR-Cut will be at a random place.

2 The camera controller is not working anymore.

A: Most likely, no SD card has been inserted in the camera when it is turned on. Please make sure a working SD card has been inserted in the camera before it is turned on.

3 The display screen is suddenly black.

A: To reduce power consumption, **the camera will shut down automatically after 3 minutes if no operation is done.** Please turn on the power again if you want to continue to work with the control.

Appendix I: PIR Detection Zone

Fig.9 shows Bolymedia's 4 kinds of detection range at different detection angles. This camera is super long range with 60 degree.

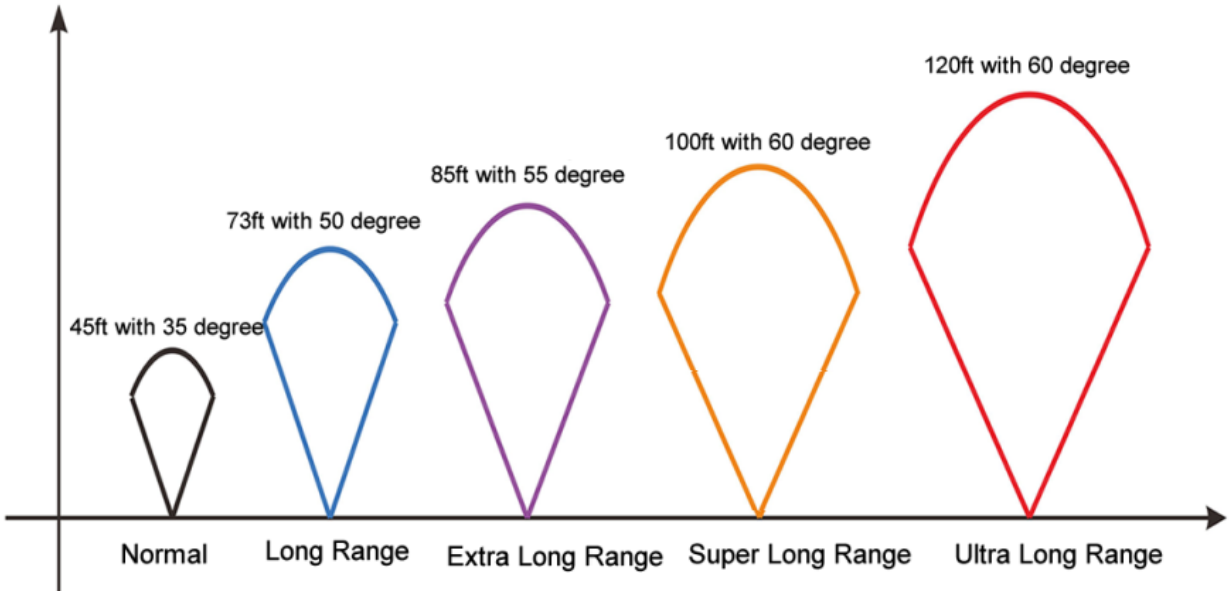

Fig. 9: PIR Detection Zone

The PIR detection angle (α) is just smaller than the field of view (FOV) angle (β). The advantage of this design is to reduce empty picture rate and capture most, if not all, motions.

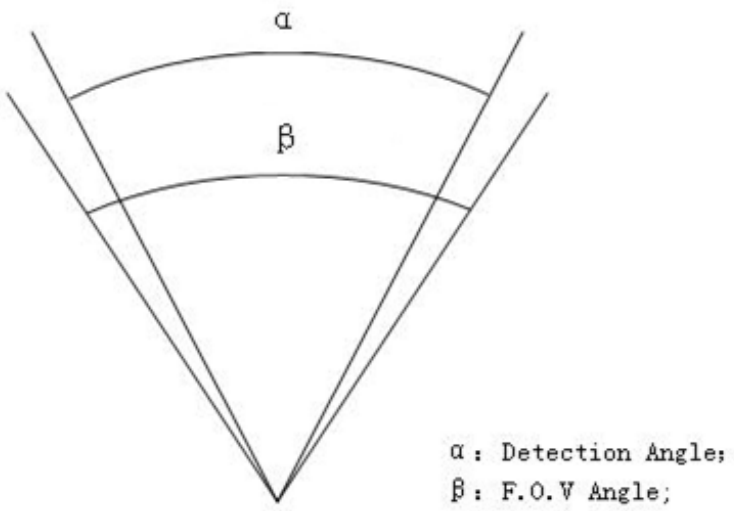

Fig. 10: Detection angle vs. FOV angle

This camera has a new, patented design of PIR. The new patented PIR's detection range can reach to 100ft (in good environments). Fig. 11 shows the comparison of the detection zones between normal PIR and the new patented PIR.

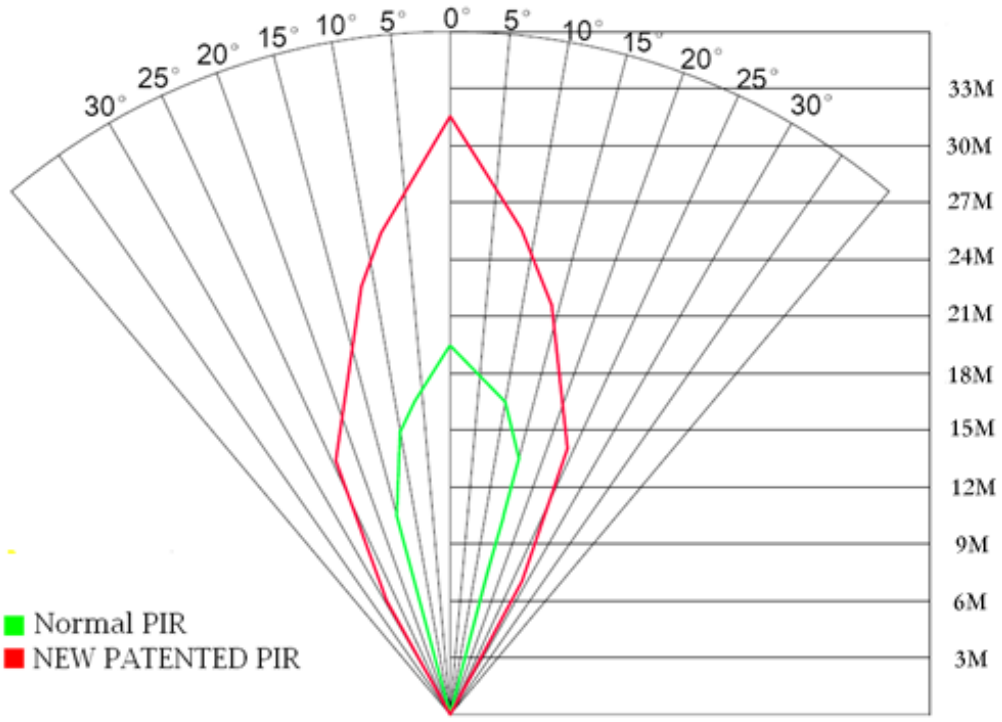

Fig. 11: Comparison of Detection Zones of new and existing PIR

Appendix Ⅱ: Technical Specifications

Image Sensor	5MP Color CMOS, 8MP interpolation
Lens	F/NO=3.0; FOV(Field of View)=55°; Two focus
IR-Flash	Up to 85ft (940nm Black IR LEDs)
Detection Range	Up to 100ft
Display Screen	2.0" TFT
Memory Card	Up to 32GB
Picture Resolution	8MP = 3264×2448 5MP = 2560×1920
Video Resolution	1280x720(25fps) 640×480 (20fps)
PIR Sensor	Multi Zone
PIR Sensitivity	Adjustable (High/Normal/Low)
Trigger Time	1.2s
Weight	0.26 kg
Operation/Storage Temp	-20 - +60°C / -30 - +70°C
Interval	0s – 60 min.
Photo Burst	1 – 3
Video Length	5 – 60s
Power Supply	8× AA (recommended) or 4× AA (minimum)
Stand-by Current	< 0.3 mA (<7mAh/Day)
Display Screen	LCD display
Mounting	Rope/Belt/Python lock
Dimensions	140x 80x 50 mm
Operation Humidity	5% - 90%
Security authentication	FCC, CE, RoHS

*without battery

Appendix III: Parts List

Part Name	Quantity
Digital Camera	One
USB Cable	One
Belt	One
User's Manual	One
Warranty Card	One

(Version 1.0)